PATENT SPECIFICATION

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COMPLETE SPECIFICATION

Valves Controlling Fluid Flow

I, ALBERT JOLY, of Route de la Gare, Berre L'Etang, Bouches du Rhone, France, of Swiss nationality, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

It is known that, as a result of various causes internal combustion engines can become over-heated, and that such over-heating can cause damage to the engine, such as fracture of the engine block caused by, for example, the absence of cooling water.

The object of this invention is to provide a safety valve which assures an automatic interruption of the engine when it reaches a predetermined and dangerous temperature.

According to the present invention, a temperature-operated fuel cut-off device for an internal combustion engine of the kind having an engine block and a feed conduit for liquid fuel comprises a valve housing for connection in the feed conduit, said housing including an inlet port and an outlet port connected by a valve opening and a valve seating at said valve opening, a valve member positioned within the housing adjacent the valve seating and capable of limited movement within the housing for sealing and unsealing the valve opening, spring means disposed in the housing and arranged to act between the valve member and the housing whereby the valve member is normally spaced from the valve opening to allow passage of fuel, a flexible diaphragm secured in the housing and defining therein at one of its faces a chamber, the other face of the diaphragm having the valve member urged against it by the spring means, a capillary tube opening at one end into said chamber, a bulb connected to and communicating with the other end of the capillary tube, said bulb being for mounting in heat-transfer relationship with the engine block, and said bulb containing a quantity of liquid having a boiling point approximately at the temperature at which the cut-off device is designed to operate, whereby at lower temperatures the pressure in the bulb, capillary tube and chamber is insufficient to close the valve against its spring-loading, and at said temperature and at higher temperatures the liquid in the bulb boils and the vapour pressure in the chamber is sufficient to close the valve to cut off the fuel supply to the engine.

The housing is preferably formed in two parts, said parts being a valve part including the inlet port, valve opening and valve seating and the outlet port, and a cover part including a connection to the capillary tube, the diaphragm being secured between said two parts.

In the accompanying drawing given by way of example of one of the forms of construction of the invention, the device is shown in longitudinal section.

The device consists of a body 1 provided with an inlet port 2, a valve seat 3 and a discharge port 4.

The upper part of the body 1 is provided with an annular groove 5 receiving one end of a spring 6.

The cover of the body which is provided with a central opening 10 is secured to the body by screws 11 and 12, the latter passing through the periphery of a flexible diaphragm 13. A valve closure member 14 is provided with a plate 15, the diameter of which corresponds to that of an opening 16 in the body whereby the spring 6 maintains the valve closure member in the open position.

The opening 10 has its outlet in an hermetically sealed chamber 17 and joined by a capillary tube 18 with a bulb 19 which is arranged in heat-transfer relationship on the engine block, the bulb containing a liquid which upon reaching a particular temperature undergoes a change of state and becomes steam.

When the engine reaches a dangerous predetermined temperature, 120° C. or 150° C. for instance, the liquid in bulb 19 starts boiling and the pressure of the steam pushes

[*Price 3s. 6d.*]

against the diaphragm 13. The valve closure member 14 is pushed against its seat 3 and the communication between the ports 2 and 4 is interrupted, and fuel can no longer be supplied to the engine which will stop.

So long as the temperature of the engine stays high, the steam cannot condense and the pressure developed maintains the valve closed.

When cooling and condensation of the liquid occurs the pressure reduces and the spring 6 pushes against the plate 15. Following the same movement, the diaphragm returns to its normal position allowing the valve closure member 14 to leave its seat 3. Fuel is now able to again flow to the engine. The cycle will be repeated as often as the temperature of the engine rises to or above the dangerous predetermined value. This avoids breaking and damaging the cylinder block of the engine and its accessories. This safety mechanism can be provided on diesel or petrol-fueled engines. The robust construction of the parts, their simplicity and interchangeability give this valve construction a maximum of useful effects.

WHAT I CLAIM IS:—

1. A temperature-operated fuel cut-off device for an internal combustion engine of the kind having an engine block and a feed conduit for liquid fuel, said device comprising a valve housing for connection in the feed conduit, said housing including an inlet port and an outlet port connected by a valve opening and a valve seating at said valve opening, a valve member positioned within the housing adjacent the valve seating and capable of limited movement within the housing for sealing and unsealing the valve opening, spring means disposed in the housing and arranged to act between the valve member and the housing whereby the valve member is normally spaced from the valve opening to allow passage of fuel, a flexible diaphragm secured in the housing and defining therein at one of its faces a chamber, the other face of the diaphragm having the valve member urged against it by the spring means, a capillary tube opening at one end into said chamber, a bulb connected to and communicating with the other end of the capillary tube, said bulb being for mounting in heat-transfer relationship with the engine block, and said bulb containing a quantity of liquid having a boiling point approximately at the temperature at which the cut-off device is desiged to operate, whereby at lower temperatures the pressure in the bulb, capillary tube and chamber is insufficient to close the valve against its spring-loading, and at said temperature and at higher temperatures the liquid in the bulb boils and the vapour pressure in the chamber is sufficient to close the valve to cut off the fuel supply to the engine.

2. A temperature-operated fuel cut-off device, as claimed in Claim 1, wherein the housing is formed in two parts, said parts being a valve part including the inlet port, valve opening and valve seating and the outlet port, and a cover part including a connection to the capillary tube, the diaphragm being secured between said two parts.

3. A temperature-operated fuel cut-off device for an internal combustion engine constructed and arranged substantially as described with reference to the accompanying drawing.

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253, Gray's Inn Road, London, W.C.1.

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811,022 COMPLETE SPECIFICATION

1 SHEET

This drawing is a reproduction of the Original on a reduced scale.